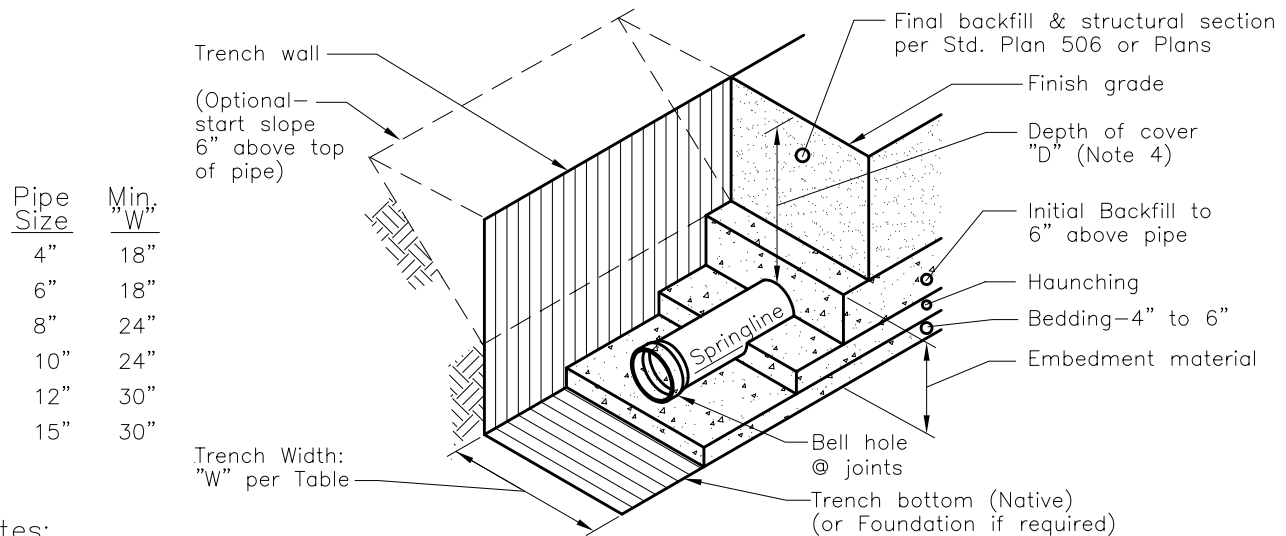




CITY OF LODI

PUBLIC WORKS DEPARTMENT

Pipe Bedding & Backfill— Flexible Pipe Trench Section



Pipe Size	Min. "W"
4"	18"
6"	18"
8"	24"
10"	24"
12"	30"
15"	30"

Notes:

1. This Std is for PVC SDR 35 (4" thru 15" dia), C900, & ductile iron pipe (up thru 14" dia) conforming to City Design Standards and Construction Specifications.
2. Class 1 embedment material shall be used unless specified otherwise on the plans.
3. This Std applicable only for stable trench walls where no standing water or groundwater is anticipated. Special details required for unstable soil identified in soils report. For minor occurrences of instability (sand pockets, etc), voids in the embedment zone shall be filled with the specified embedment material to at least two pipe diameters all around the pipe.
4. Minimum depth of cover for mains is 3 ft to finish grade; service laterals per plans.
5. With crushed rock embedment, install a cut-off dam of 3 ft. of approved material every 100 ft. Crushed rock shall meet 3/4" or 1/2" max. aggregate asphalt concrete specifications or as approved by the Engineer.
6. For Water Pipes use native material for backfill.

EMBEDMENT MATERIAL

	CLASS I	CLASS II	CLASS III	CLASS IV	CLASS V
Description	Crushed Rock 3/4"—1/4"	Coarse Sand & Gravel	Fine Sand Mixtures	Silt, Silty Clays	Organic Soils
USC Soil Type	Well graded (See Note 5)	GW, GP, SW, SP	GM, GC, SM, SC	MH, ML, CH, CL	OL, OH, PT
Foundation	If required, per special design to be shown on plans				
Bedding	Consolidate with vibrator or flat shovel "slicing" (See Note 5)	Compact to 85% Min. R.C.	Compact to 90% Min. R.C.	Special Design	Not Permitted
Haunching		Cut-off dam (per Note 5)	Compact to 90% Min. R.C. in <u>two lifts</u>		
Initial Backfill		Compact to 85% Min. R.C. in <u>two lifts</u>	Compact to 90% Min. R.C. in <u>two lifts</u>		
Maximum Depth of Cover "D" (without special design)	20 ft	20 ft	20 ft		

Dr. KT	No.	Date	Revision	Appr.	Approved By:	STD PLAN
Ch. WS	1	9/25	ADDED C900 PIPE		<i>F. Wally Sandelin</i>	501A
Date 12/00					F. Wally Sandelin City Engineer R.C.E. 39895	9/25/02 Date



CITY OF LODI

PUBLIC WORKS DEPARTMENT

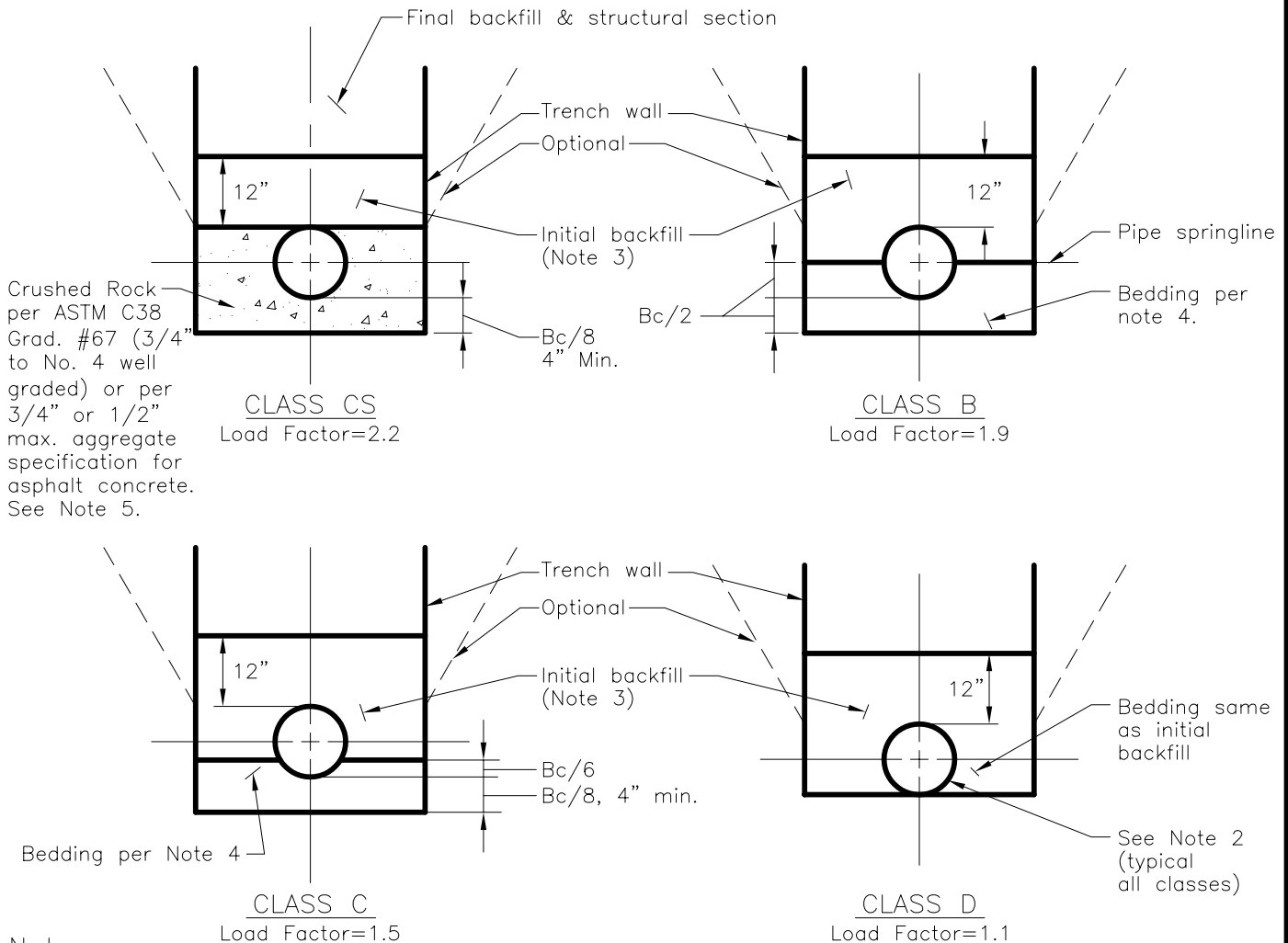
Pipe Bedding & Backfill— Rigid Pipe Trench Section

Legend:

D=Nominal pipe inside diameter (in.)

Bc=Pipe outside diameter (in.)

Bd=Trench width @ top of pipe= $Bc+8$ " min. each side (24" total minimum)



Notes:

1. This Standard is for rigid pipes 4" & larger; conforming to City Design Stds and Construction Specifications. Use Trench Class as shown on the plans; if not specified, use appropriate class per pipe material and depth of cover per Std Plan 501C.
2. Provide uniform & continuous support of pipe barrel between bell or coupling holes.
3. Initial backfill shall be selected sandy material per Construction Spec. Sect.6-19.02 @ 90% R.C. min.
4. Class B & C bedding material to be crushed rock per Class CS or sand as specified on the plans.
5. With crushed rock bedding, install a cut-off dam of 3 ft. of approved material every 100 ft.

Dr. KT	No. 1	Date 6/25	Revision ADDED C900 PIPE	Appr.	Approved By: <i>F. Wally Sandelin</i>	6/25/02	STD PLAN
Ch. WS					F. Wally Sandelin City Engineer R.C.E. 39895	Date	501B
Date 12/00							



CITY OF LODI

PUBLIC WORKS DEPARTMENT

Pipe Bedding & Backfill— Rigid Pipe Bedding Requirements

Pipe Material			Class	Size (in.)	Minimum Trench Class per Std Plan 501B Depth of Cover (ft.)							
					3	4	5	6	7	8	9	10
Asbestos Cement, AWWA C401			150	4 thru 14	D							
Non-Reinforced Concrete, ASTM C-14			2	12	D		C			B		
				15								
				18								
				21								
				24								
			3	12	D					B		
				15								
				18								
				21								
				24								
Reinforced Concrete, ASTM C-76			III	12	C					B		
				15								
				18								
				21	D							
				24								
			IV	12	D					C		
				15								
				18								
				21								
				24								
			V	12	D							
				15								
				18								
				21								
				24								
Vitrified Clay Pipe, ASTM C700 Extra Strength				4								
				6								
				8								
				10								
				12								

Dr. KT

No. 1

Date 9/25

Revision

ADDED C900 PIPE

Appr.

Approved By:

F. Wally Sandelin
F. Wally Sandelin
City Engineer
R.C.E. 39895

9/25/02
Date

STD PLAN

501C

Ch. WS

Date 12/00



CITY OF LODI

PUBLIC WORKS DEPARTMENT

Standard Abbreviations

Aggregate base	AB
American Society for Testing and Materials	ASTM
American Water Works Association	AWWA
Approximately	APPROX
Asbestos cement pipe	ACP
Asphalt concrete	AC
Back of walk	BOW
Begin curb return	BCR
Begin curve	BC
Begin vertical curve	BVC
Bench mark monument	BM
Blow off	BO
Cable Television	CATV
Cast iron pipe	CIP
Centerline	C/L
Center to Center	C-C
Centimeter	cm
Central angle	Δ
Central California Traction Company	CCTC
City of Lodi	COL
Class	CL
Cleanout	CO
Commercial driveway	COMM DWY
Compacted Original Ground	COG
Concrete	CONC
Concrete pipe	CP
Construct	CONST
Corrugated metal pipe	CMP
Cubic feet per second	CFS
Cubic yards	CY
Curb & gutter	C&G
Curb, gutter & sidewalk	CG&S
Diameter	DIA
Distance	DIST
Driveway	DWY
Drop inlet catch basin	DICB
Ductile Iron	DIP
Each	EA
Edge of pavement	EP
Electric	ELEC
Elevation	ELEV
End curb return	ECR
End curve	EC
End vertical curve	EVC
Existing	EX
Feet per Second	FPS
Finish grade	FG
Fire Hydrant	FH
Flowline	FL
Fire Service	FS
Face of Curb	FOC
Foot	FT

Gas	G
Galvanized	GALV
Gallons per Minute	GPM
Gas valve	GV
Global Positioning System	GPS
Grade Break	GB
Guy pole	GP
High point	HP
High pressure gas	HPG
Horizontal	HOR
Inch	IN.
Industrial waste	IW
Inside diameter	ID
Invert	INV
Joint use pole	JP
Kilometer	Km
Length	L
Lineal feet	LF
Low point	LP
Low pressure gas	LPG
Lump sum	LS
Manhole	MH
Maximum	MAX
Meter	M
Millimeter	mm
Minimum	MIN
Miscellaneous	MISC
North, South, East, West	N,S,E,W
Northerly, etc.	N'LY
Original ground	OG
Outside Diameter	OD
Parking meter	PM
Pavement	PVMT
Pedestrian	PED
Point of intersection	PI
Point of reverse curve	PRC
Portland Cement Concrete	POC
Point on tangent	POT
Polyvinylchloride	PVC
Pothole	PH
Power poles	PP
Property line	P/L
Public utility easement	PUE
Pull box	PB

Sheet 1 of 2

Dr. KT	No. 1	Date 6/25	Revision ALL ABBREVIATIONS REVIEWED	Appr.	Approved By: <i>F. Wally Sandelin</i>	9/25/02	STD PLAN
Ch. WS					F. Wally Sandelin City Engineer R.C.E. 39895	Date	502
Date 12/00							



CITY OF LODI

PUBLIC WORKS DEPARTMENT

Standard Abbreviations

Radius	R
Rehabilitate	REHAB
Reinforce,(ed), (ing)	REINF
Reinforced concrete pipe	RCP
Relative compaction	RC
Remote control valve	RCV
Residential driveway	RES DWY
Right of way	R/W
Rubberized Hot Asphalt Concrete	RHAC
Sheet	SHT
Side inlet catch basin	SICB
Sidewalk	SWK
Southern Pacific Railroad	SPRR
Specification	SPEC
Sprinkler head	SH
Square feet	SF
Square type	SQ TYPE
Standard	STD
Station	STA
Storm Drain	SDMH
Storm Drain Manhole	SD
Street Name Sign	SNS
Street light conduit	SL
Subdivision	SUBD
Survey Monument	MON
Tangent	T
Telephone (underground)	TEL
Telephone pole	TP
Top of curb	TOC
Traffic signal conduit	TS
Tree well	TW
Typical	TYP
Underground Service Alert	USA
Underground Utility Vault	UUV
Union Pacific Railroad	UPRR
Vertical curve	VC
Vitrified clay pipe	VCP
Wastewater	WW
Wastewater Manhole	WWMH
Wastewater service	WWS
Water	W
Water service	WS
Water service box	WSB
Water valve	WV
Weakened plane joint	WPJ
Woodbridge Irrigation Dist	WID
Yard	YD

Sheet 2 of 2

Dr. KT	No.	Date	Revision	Appr.	Approved By:	STD PLAN
Ch. WS	1	9/25	ALL ABBREVIATIONS REVIEWED		<i>F. Wally Sandelin</i>	
Date 12/00					F. Wally Sandelin City Engineer R.C.E. 39895	9/25/02 Date
						502

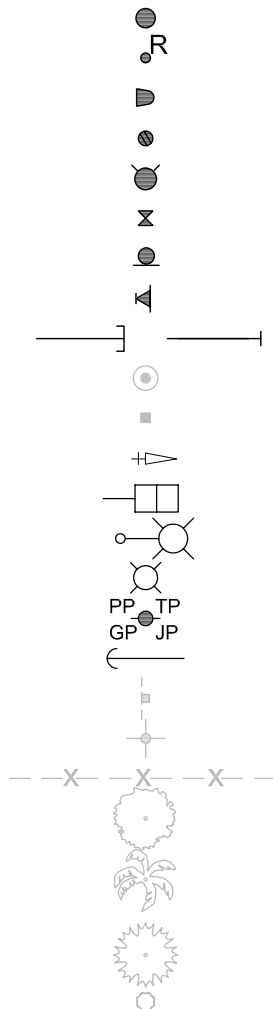
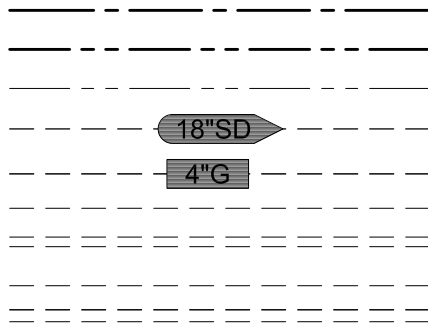


CITY OF LODI

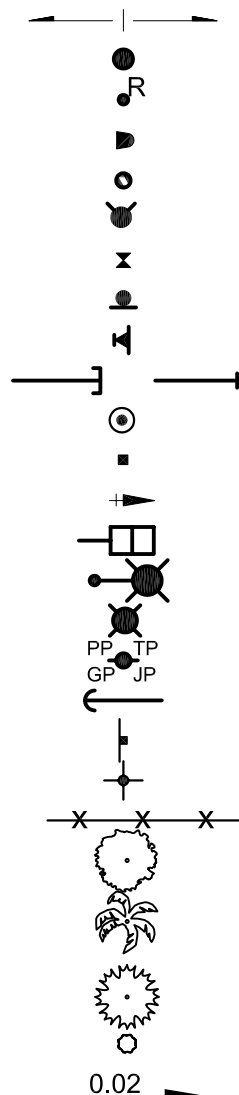
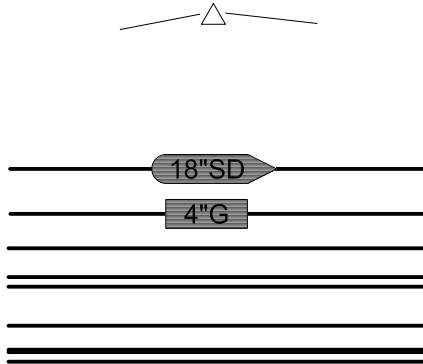
PUBLIC WORKS DEPARTMENT

DRAFTING SYMBOLS

EXISTING



CONSTRUCT



- Grade Break on TC
- Centerline
- Right-of-way
- Property Line
- SD, W, WW or IW (noted) with direct
- Other Underground Utilities (noted)
- Rolled C,G & S
- Vertical C,G & S
- High Point in Flow line
- Manhole
- Riser
- Side Inlet Catch Basin
- Drop Inlet Catch Basin
- Fire Hydrant
- Water Valve
- Blow-off
- Reducer
- Cap & Blind Flange
- Centerline Survey Monument
- City of Lodi Bench Mark
- Traffic Signal Head
- Pedestrian Head
- Electrolier (mast. arm type)
- Electrolier (concrete standard)
- Utility Pole (type as noted)
- Guy Anchor
- Sign (type as noted)
- Street Name Sign
- Fence (type as noted)
- Deciduous & other Leafed Trees (diameter as noted)
- Palm Trees (diameter as noted)
- Pine, Fir or Cedar Trees (diameter as noted)
- Hedge or Bush
- Slope of Pipe

Dr.	KT	No.	Date	Revision	Appr.	Approved By:	STD PLAN
		1	7/01	UPDATE PER FIRST REVISION			
Ch.	WS	2	9/25	REVISED SICB SYMBOL			
Date	12/00						

Approved By:
F. Wally Sanden
F. Wally Sanden
City Engineer
R.C.E. 39895

9/25/02
Date

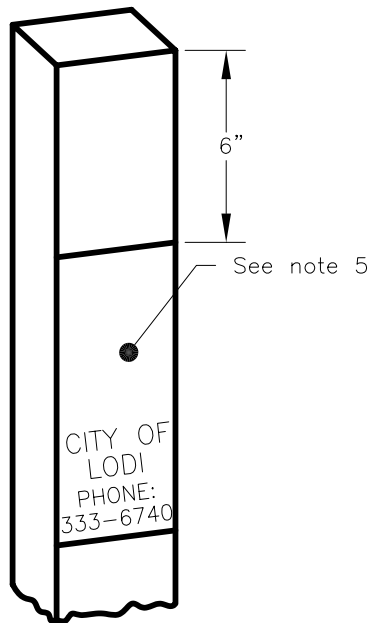
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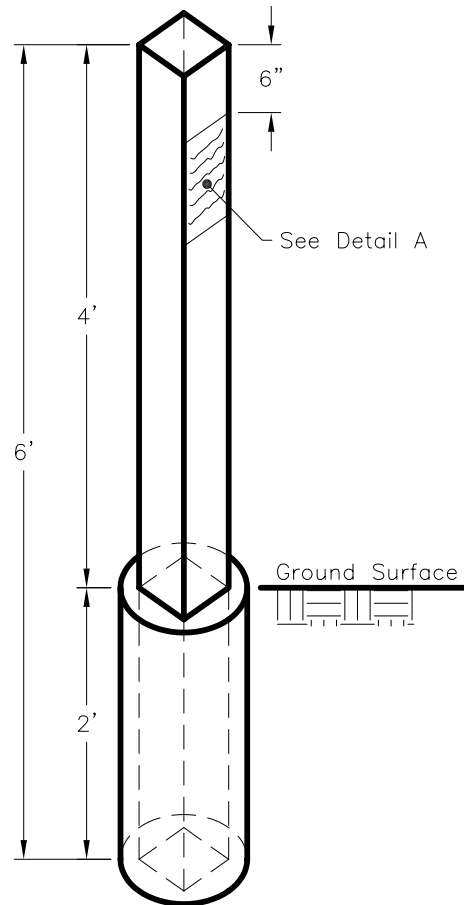
CITY OF LODI

PUBLIC WORKS DEPARTMENT

Pipe Marker



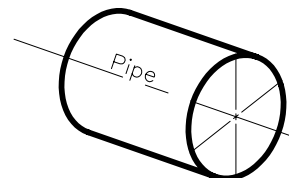
DETAIL A



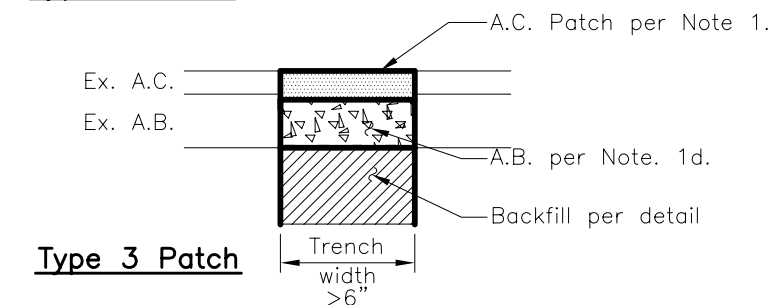
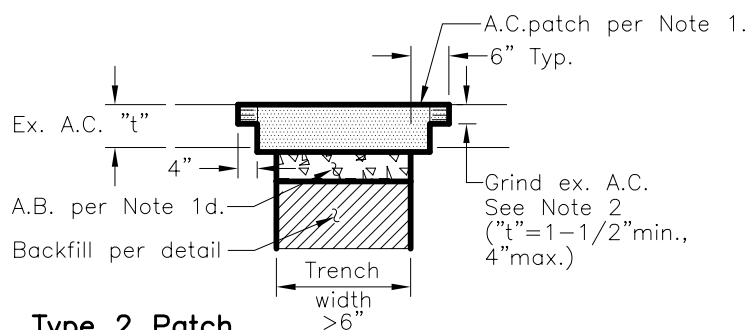
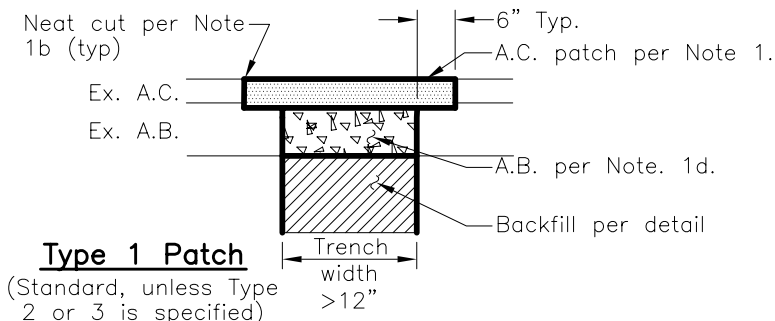
Notes:

1. Posts to be 4"x4" foundation grade Redwood or pressure treated Douglas Fir
2. Posts to be encased in concrete - 8" diameter x 2' deep
3. Posts shall be painted white using 2 coats
4. Use 1/2" block black lettering on both sides of the post in line with the pipe
5. Posts shall state diameter and type of pipe as follows:

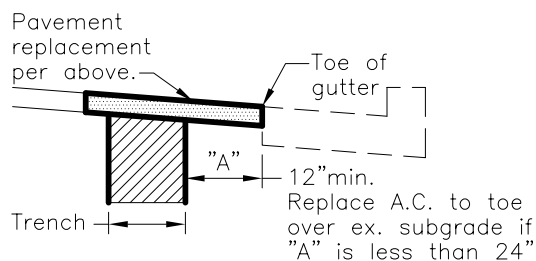
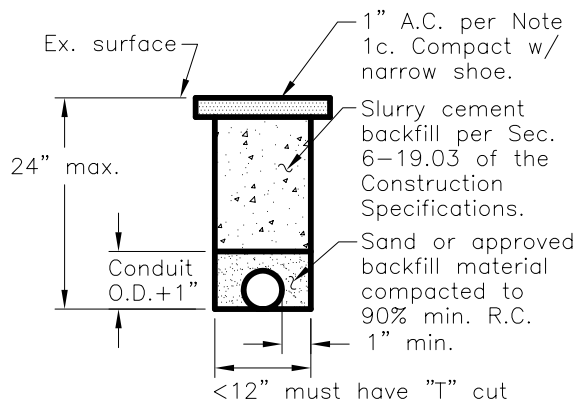
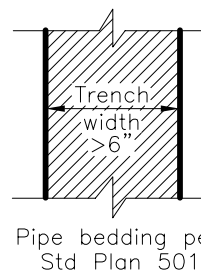
Examples: 1) 8-INCH WATER MAIN 2) 24-INCH WASTE WATER 3) 12-INCH STORM DRAIN



Dr. KT	No.	Date	Revision	Appr.	Approved By: <i>F. Wally Sandelin</i>	STD PLAN
Ch. WS					12/28/00	505
Date 12/00					R.C.E. 39895	



Backfill:
Native material @ 90%
R.C. except approved
select material or A.B.
Cl. 2 @ 95% required
for:
a.) Type 2 patch
b.) Excavation smaller
than 3'x3'



- ## SPECIAL CASES
1. Type 1 Patch:
 - a) Total AC thickness to match existing plus 1", 3" minimum applied in two lifts.
 - b) Drop hammer or other rough cut allowed for initial cut along trench wall. Final AC removal per Sec. 6-15.02 "Removal Method" of the Construction Specification.
 - c) AC replacement per Sec. 6-39.04 "Trench Replacement and Shoulder Paving" of the Construction Specifications.
 - d) AB thickness per Plans. AB may be replaced by additional AC (50% of req'd AB thickness).
 2. Type 2 patch optional, except when required by the City. Grind depth "t" shall be adjusted to match existing overlay thickness.
 3. Type 3 Patch to be used when shown on the plans or as approved by the Engineer, generally on streets to be overlaid.
 4. Controlled density fill (CDF) may be used for backfill with the prior approval of the Engineer.

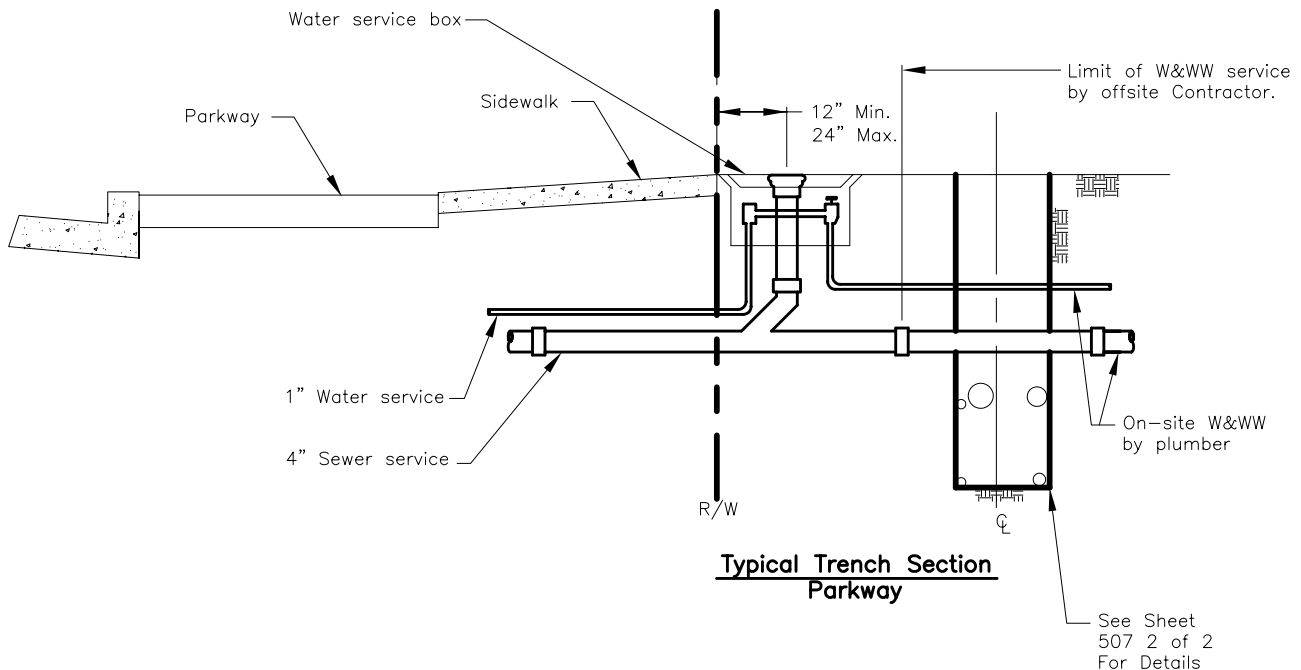
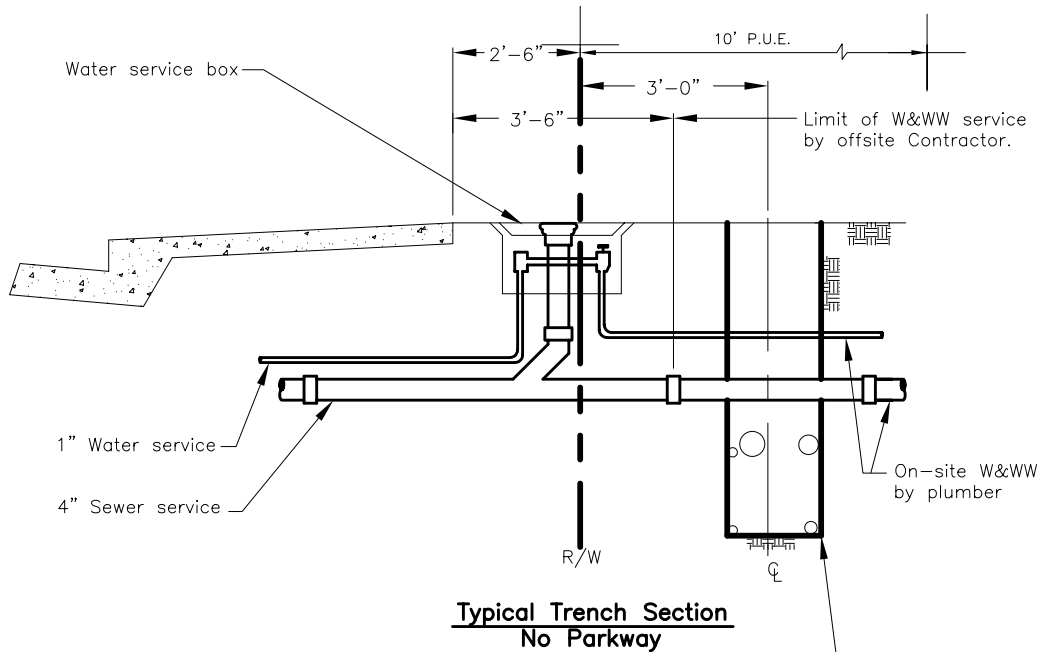
Dr. KT	No.	Date	Revision	Appr.	Approved By:	STD PLAN
Ch. WS	1	9/25	REVISED AB PATTERN		<i>F. Wally Sandelin</i> 9/25/02	506
Date 12/00					F. Wally Sandelin City Engineer R.C.E. 39895 Date	



CITY OF LODI

PUBLIC WORKS DEPARTMENT

Joint Trenching Details



Note:

1. Also See Std Plans 201, 203, 403, & 414.

1 of 2

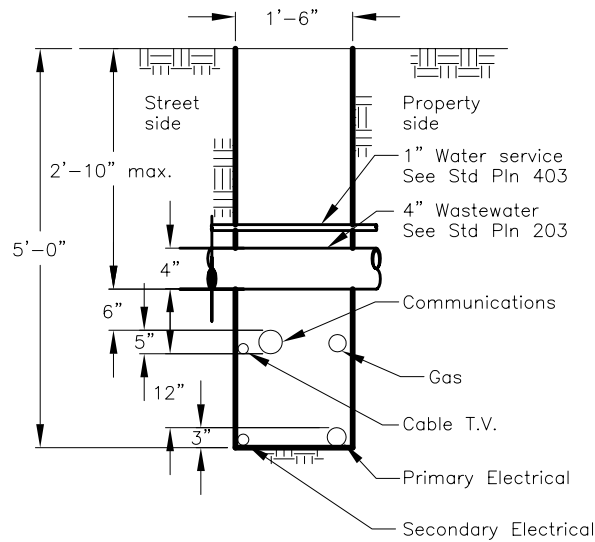
Dr. KT	No. 1	Date 9/25	Revision ADDED PARKWAY LAYOUT	Appr.	Approved By: <i>F. Wally Sandelin</i>	9/25/02	STD PLAN
Ch. WS					F. Wally Sandelin City Engineer R.C.E. 39895	Date	507
Date 12/00							



CITY OF LODI

PUBLIC WORKS DEPARTMENT

Joint Trenching Details



Trench Section

Electric, telephone, and cable T.V. boxes to be set as determined by each agency in the 10' P.U.E.

2 of 2

Dr. KT	No. 1	Date 9/25	Revision ADDED PARKWAY LAYOUT	Appr.	Approved By: <i>F. Wally Sandelin</i>	STD PLAN
Ch. WS					F. Wally Sandelin City Engineer R.C.E. 39895	507
Date 12/00					9/25/02 Date	